

April 15, 2014

MEMORANDUM FOR: NCEP Model Implementation Scientific Review Team

FROM: Chris Caruso Magee, Team Lead, Production Control  
Production Management Branch, NCEP Central Operations

SUBJECT: Proposed Implementation of High-Resolution Window v6.0.6

The Environmental Modeling Center (EMC) has proposed implementation of the High-Resolution Window (HiResW) forecast system v6.0.6.

This upgrade of the HiResW is being implemented to improve the skill and utility of forecast guidance produced by the HiResW system. The improvement in forecast skill and utility will be manifested in improved statistical performance metrics and accomplished with a package of enhancements. This package includes upgrading model versions from WRFv3.1.1 to WRFv3.5 for the WRF-ARW, replacing the WRF-NMM with the NEMS/NMMB model, adjusting model configurations, and adding extra variables in the product suite requested by users.

Changes to the HiResW include:

1. Upgrade/replace versions of WRF used in HiResW
  - a. Replace WRF-NMM with NEMS/NMMB model (the model currently being refined with NAM development)
    - i. [http://www.emc.ncep.noaa.gov/mmb/mmbpll/misc/NAM\\_NMMB\\_Implementation.ppt](http://www.emc.ncep.noaa.gov/mmb/mmbpll/misc/NAM_NMMB_Implementation.ppt)
  - b. Upgrade WRF-ARW from v3.1.1 to v3.5
    - i. <http://wrf-model.org/users/release.php>
2. Adjust configurations and options
  - a. Merge the West-Central and East-Central domains into a single CONUS-sized grid.
  - b. Increase horizontal resolution from 5.15 km to 3.5-4.2 km for WRF-ARW, and from 4.0 to 3.0-3.6 km for the NMMB (formerly WRF-NMM)
  - c. Increase the number of vertical levels from 35 to 40.
  - d. Physics upgrades: WSM3 to WSM6 microphysics for WRF-ARW, GFDL radiation in WRF-NMM to be replaced by RRTM radiation in NMMB.
3. Add a second daily run for Alaska (now 06Z and 18Z) and western CONUS (06Z West-Central run replaced by 00Z/12Z CONUS runs)
4. Address known weaknesses in meteorological performance as observed by EMC/MMB staff, NCEP Service Centers, and the external forecaster / user community.

Output changes include:

1. Add/fix gridded fields to/in product output
  - a. Add additional isobaric level output for ensemble product generation
  - b. Add additional model level output fields for use by Guam RTMA.
  - c. Add tactical (short range) fire weather guidance products

Please see the HiResW Technical Implementation Notice (details below) for full details on the changes included with this upgrade.

**Real time parallel data:**

Beginning Tuesday, April 15, 2014 and starting with the 1800Z cycle, a consistent parallel feed of data will be available at:

HTTP:

<http://www ftp.ncep.noaa.gov/data/nccf/com/hiresw/para/hiresw.YYYYMMDD>

FTP:

<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/hiresw/para/hiresw.YYYYMMDD>

where YYYYMMDD is the year, month, day.

**Technical Implementation Notices**

The Technical Implementation Notice (TIN) for the HiResW update may be found at:

<http://www.nws.noaa.gov/os/notification/tin14-16hiresw.htm>

**Request for Evaluation**

SPC, WPC, AWC, and all NWS Regions are listed as being primarily responsible for this evaluation. All other Service Centers, government agencies, or private companies not listed above are optional.

The evaluation period will start at 18Z on Tuesday, April 15, 2014 and run through May 14, 2014. Participants need to complete the attached “Model Implementation Subjective Evaluation Report” form and return to [Chris.Caruso.Magee@noaa.gov](mailto:Chris.Caruso.Magee@noaa.gov) no later than May 20, 2014. Please indicate the overall performance of the product, with any additional comments on specific cases with noteworthy positive or negative performance. Please note that NCO requires evaluators to specifically address the benefits stated in the attached form as to whether those benefits were observed or not. Any feedback you wish to provide during the evaluation period should be emailed to [Chris.Caruso.Magee@noaa.gov](mailto:Chris.Caruso.Magee@noaa.gov).

A final coordination teleconference will be scheduled to review the evaluation and address any outstanding issues. Based on the outcome of that teleconference, EMC and NCO will prepare a recommendation for the NCEP Director. This teleconference has not yet been scheduled.

**Points of Contact**

[Chris.Caruso.Magee@noaa.gov](mailto:Chris.Caruso.Magee@noaa.gov) (NCO)

[Matthew.Pyle@noaa.gov](mailto:Matthew.Pyle@noaa.gov) (EMC)

## Model Implementation Subjective Evaluation Report

Scientific Review Team Member: \_\_\_\_\_

Region/Service Center/Company Representing: \_\_\_\_\_

Proposed Change: HiResW v6.0.6

Model Developer: Matthew Pyle (EMC)

Real-Time Parallel Runs:

General comments: \_\_\_\_\_

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### Evaluation of expected benefits:

Please respond to the following questions and note if they are beneficial to you?

1. Do the NMMB runs will significantly reduce the high bias in spatial coverage of heavy precipitation when compared to the current operational WRF-NMM runs?

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2. Do the ARW runs, at least over CONUS, have a greatly reduced [by ~0.5 C] daytime cool bias in 2 m temperature, and significantly reduced [by ~0.5 m/s] nighttime high bias in 10 m winds?

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3. Do the NMMB and ARW demonstrate a moderate reduction in high 2 m dew points (again, over CONUS)?

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4. Does ARW show a moderate reduction in high 10 m wind bias at all times over Alaska?

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5. Does this upgrade provide SPC with better forecasts of convective storms?

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6. Does this upgrade provide the Boise fire center, WFOs and IMETs with improved tactical fire weather guidance?

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**Recommendation:**

**Implement as proposed** \_\_\_\_

**Reevaluate after changes** \_\_\_\_

**Do not implement** \_\_\_\_